UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

BAUM RESEARCH AND
DEVELOPMENT CO., INC., et al.,

Plaintiff,

Hon. Ellen S. Carmody

v.

Case No. 1:02-cv-674

UNIVERSITY OF MASSACHUSETTS
AT LOWELL,

Defendant.
_____/

OPINION AND ORDER CONSTRUING CLAIMS OF UNITED STATES PATENTS 5,988,861 AND 6,640,200

Plaintiffs initiated this matter asserting, among other things, infringement by Defendant of United States Patents 5,988,861 (hereinafter the '861 patent) and 6,640,200 (hereinafter the '200 patent). The Court has conducted a *Markman* hearing to learn the parties' position concerning the claim terms in dispute. Having carefully considered the patents, the parties' briefs and other submissions, and the arguments of counsel, the Court now makes the following findings and construes the disputed claim terms as follows.

LEGAL STANDARD

Construing or interpreting the claims of a patent is a matter of law which the Court must undertake. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). In other words, the Court must determine as a matter of law the meaning of the claims at issue and instruct the jury accordingly.

See Exxon Chem. Patents, Inc. v. Lubrizol Corp., 64 F.3d 1553, 1555 (Fed. Cir. 1995) (citations omitted).

It is a "bedrock principle" of patent law that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (citation omitted). The claims of a patent are "of primary importance in the effort to ascertain precisely what it is that is patented." *Id.* at 1312 (quoting *Merrill v. Yeomans*, 94 U.S. 568, 570 (1876)). Because it is the patentee's responsibility to "define precisely what his invention is," it is "unjust to the public, as well as an evasion of the law, to construe [the patent's claims] in a manner different from the plain import of [their] terms." *Phillips*, 415 F.3d at 1312 (quoting *White v. Dunbar*, 119 U.S. 47, 52 (1886)). Courts are instructed to interpret the terms of a patent's claims consistent with their "ordinary and customary meaning," as defined by "a person of ordinary skill in the art in question at the time of the invention." *Phillips*, 415 F.3d at 1312-13 (citations omitted). Moreover, the person of ordinary skill in the art is "deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* at 1313 (citation omitted).

The ordinary meaning of claim terms, as understood by a person of ordinary skill in the art, is often "readily apparent even to lay judges," in which case claim construction "involves little more than the application of the widely accepted meaning of commonly understood words." *Id.* at 1314 (citation omitted). However, it is often the case that the ordinary and customary meaning of a claim term as understood by a person of ordinary skill in the art is not immediately apparent. *Id.* In such circumstances, the Court must look to "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." *Id.* (citation omitted).

These sources include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.* (citations omitted).

While it may be necessary to consult extrinsic evidence or to examine other portions of the patent itself, it must be remembered that "the claims themselves provide substantial guidance as to the meaning of particular claim terms." *Id.* (citations omitted). However, the claims of a patent do not "stand alone," but are instead part of "a fully integrated written instrument." *Id.* at 1315 (citation omitted). Accordingly, claims "must be read in view of the specification, of which they are a part." *Id.* (citation omitted). A patent's specification "is always highly relevant to the claim construction analysis" and is usually dispositive, as "it is the single best guide to the meaning of a disputed term. *Id.* (citation omitted). Thus, where the specification indicates that the patentee intended to define a particular term differently than such term is generally understood, the patentee's intention prevails. *Id.* at 1316 (citation omitted).

ANALYSIS

I. Claims 1, 6, and 16 of the '861 Patent and Claim 1 of the '200 Patent

The examination of these particular claims requires two separate analyses. The parties agree that portions of these claims are articulated in "means-plus-function" language. With respect to such portions, the Court must determine whether the patents in question contain the requisite disclosure and specificity. Aside from the means-plus-function aspect of these claims, the parties also disagree as to whether certain language in these claims requires further "construction" or "interpretation." The

Court will first address the means-plus-function analysis before turning its attention to the remaining components of these particular claims.

A. Means-Plus-Function

Defendant asserts that the aforementioned claims are invalid because they invoke means-plus-function language without also articulating the required degree of structure. Defendant asserts, therefore, that these particular claims are invalid as not sufficiently specific. For the reasons discussed below, the Court disagrees. The relevant language of these claims is as follows:

Claim 1 - '861 Patent

> programmed computer means including a user input, a display, and interface to the first and second electromotive sources and to the sensors, the programmed computer means being operative to perform the following functions:
>
> (a) activate the first and second electromotive sources in response to the user input so that the implement strikes the object, causing the object to enter the flight path,
>
> (b) construct a database of performance characteristics associated with at least the implement based upon the signals output by the various sensors, and
>
> (c) display selected portions of the database in accordance with the user input.

Claim 6 - '861 Patent

> programmed computer means including a user input, a display, and interfaces to the first and second electromotive sources and to the sensors, the programmed computer means being operative to perform the following functions:

(a) activate the first and second electromotive sources in response to the user input so that the bat strikes the ball, causing the ball to enter the flight path,

(b) construct a database of performance characteristics associated with at least the bat based upon the signals output by the various sensors, and

(c) display selected portions of the database in accordance with the user input.

Claim 16 - '861 Patent

programmed computer means including a user input, a display, and interfaces to the motor drives and to the sensors, the programmed computer means being operative to perform the following functions:

(a) activate the motor drives in response to the user input so that the bat hits the ball and causes it to enter the trajectory,

(b) construct a database of bat performance characteristics based upon swing speed, pitch speed and exit velocity, and

(c) display selected portions of the database in accordance with the user input.

Claim 1 - '200 Patent

programmed computer means including a user input, a display, and interfaces to the first and second electromotive sources and to the sensors, the programmed computer means being operative to perform the following functions:

(a) activate the first and second electromotive sources in response to the user input so that the implement strikes the object, causing the object to enter the flight path,

(b) construct a database of performance characteristics associated with at least the implement based upon the signals output by the various sensors, and

(c) display selected portions of the database in accordance with the user input.

Federal patent law requires that every patent contain a specification that concludes "with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112 ¶¶ 1-2. This statute further provides, however, that "[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112 ¶ 6.

Thus, a patentee may articulate a claim (or a portion thereof) in means-plus-function language provided he also identifies in the patent specification the particular structure, material, or acts that correspond to the function in question. This disclosure requirement limits the scope of the claim "to the particular structure disclosed, together with equivalents" and prevents "pure functional claiming." *See, e.g., Aristocrat Technologies Australia Pty Ltd. v. International Game Technology*, 521 F.3d 1328, 1333 (Fed. Cir., 2008) ("[t]he point of the requirement that the patentee disclose particular structure in the specification and that the scope of the patent claims be limited to that structure and its equivalents is to avoid pure functional claiming."). Failure to satisfy this requirement renders the claim in question "invalid for failure to satisfy the definiteness requirement of § 112, ¶ 2." *Cardiac Pacemakers, Inc. St. Jude Medical, Inc.*, 296 F.3d 1106, 1114 (Fed. Cir. 2002) (citation omitted).

The analysis by which the Court must evaluate whether the patents in question contain the requisite disclosure is two-fold. The Court must first identify the claimed function. *Id.* at 1113 (citation omitted). In doing so, the Court "must construe the function of a means-plus-function

limitation to include the limitations contained in the claim language, and only those limitations," as "[i]t is improper to narrow the scope of the function beyond the claim language." *Id.* (citation omitted). Once the Court has identified the claimed function, it "must then determine what structure, if any, disclosed in the specification corresponds to the claimed function." *Id.* (citation omitted). With respect to this aspect of the analysis, the Federal Circuit has stated:

> In order to qualify as corresponding, the structure must not only perform the claimed function, but the specification must clearly associate the structure with the performance of the function. This inquiry is undertaken from the perspective of a person of ordinary skill in the art. Alternative embodiments may disclose different corresponding structure, and the claim is valid even if only one embodiment discloses corresponding structure. If, however, this inquiry reveals that no embodiment discloses corresponding structure, the claim is invalid for failure to satisfy the definiteness requirement of § 112, ¶ 2.

Id. at 1113-14 (internal citations omitted).

The Court is mindful, however, that the threshold Plaintiffs must clear is not a lofty one. *See Finisar*, 523 F.3d at 1341 ("This court does not impose a lofty standard in its indefiniteness cases"). Moreover, the requisite structure may be expressed in "any understandable terms. . .[or] manner that provides sufficient structure." *Id.* at 1340 (internal citation omitted). Finally, the Court notes that:

> Because the claims of a patent are afforded a statutory presumption of validity, overcoming the presumption of validity requires that any facts supporting a holding of invalidity must be proved by clear and convincing evidence. Thus, a challenge to a claim containing a means-plus-function limitation as lacking structural support requires a finding, by clear and convincing evidence, that the specification lacks disclosure of structure sufficient to be understood by one skilled in the art as being adequate to perform the recited function.

Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1376-77 (Fed. Cir. 2001) (internal citation omitted).

As noted above, the claims at issue each identify three functions which the Court will address in turn.

1. Activate the Electromotive Sources or Motor Drives

While there are minor (and insignificant) differences in the relevant claims language, the function claimed in subsection (a) of these four claims is, in the Court's estimation, rather straightforward. Simply stated, in response to user input, the "programmed computer means" is to function to activate the "first and second electromotive sources" or the "motor drives." The portion of each claim that follows the phrase "so that," is not part of the function, but is instead a description of what occurs (or is supposed to occur) as a result of the function (the activation of the motors) taking place.

Defendant asserts that the relevant claim language identifies a much different function. Specifically, Defendant asserts that "[w]ith respect to the first function (a), as explained by the patent itself, the purpose is to activate motors on the bat and the ball and *synchronize them* so that the bat strikes the ball." (Dkt. #298 at 9) (emphasis added). According to Defendant, the relevant claims are invalid because "the patent fails to disclose any structure that corresponds to and achieves this function." (Dkt. #298 at 9).

Defendant's argument is faulty, however, because it wrongly characterizes the claimed function. As previously noted, the Court "must construe the function of a means-plus-function limitation to include the limitations contained in the *claim language*, and *only* those limitations," as "[i]t is improper to narrow the scope of the function beyond the claim language." While the relevant claim language refers to the activation of the "first and second electromotive sources" (or the "motor drives") so as to cause the bat (or other implement) to strike the ball (or other object), these claims say absolutely nothing about synchronization between the bat and ball modules. Defendant is attempting to

characterize the relevant function in a manner wholly inconsistent with the relevant claim language so as to preclude a finding that the patent provides the requisite structure.

Plaintiffs assert that the "programmed computer means" requires "nothing more than a computer [that] operates as an 'on' switch to activate the two electro-servo motors that power the bat and ball arms in counter-rotational directions." (Dkt. #302 at 6). The Court agrees and, furthermore, finds that each of the two patents sufficiently articulates a structure that corresponds to and performs this function. Each of the two patents contain the following language:

> Although both computer systems may be of conventional design, the hardware options of each will preferably be selected in accordance with their respective tasks, and the software programs of the two machines will be quite different. Specifically, system 106[1] will preferably include expansion modules and input/output interfaces associated with real-time control, as further discussed below. The software resident on system 106 is also preferably dedicated to realtime industrial-type control. Although such control software may be available, in part, from the manufacturer of the particular servo-motor used as the electromotive source, in the preferred embodiment, additional code, familiar to one skilled in computer programming, is provided to ensure proper coordination between the bat-swing and ball-delivery modules.

('861 Patent at col. 4 lines 51-66; '200 Patent at col. 4 line 54 - col. 5 line 2).

In his affidavit, Dr. Hal Watson, Jr., Ph.D., P.E., asserted that an individual of ordinary skill in the art would understand that electro-server motors are equipped with realtime industrial-type control software capable of activating the electro-servo motors through computer interfaces. (Dkt. #302). The Court finds that the patent language quoted above, in light of Dr. Watson's assertions, constitutes sufficient structure to satisfy the relevant standard.

[1] System 106 is described in both patents as the "movement-control computer" which is "interfaced to" the bat-swing module and the ball-delivery module. ('861 Patent at col. 4 lines 3-8; '200 Patent at col. 4 lines 6-11).

The Court also considered the expert report of Dr. Keith Koenig, but found such to be unpersuasive. Specifically, the Court considered Dr. Koenig's opinion that the patents at issue failed to disclose sufficient or appropriate structure relative to this particular function. The Court accorded very little weight to Dr. Koenig's opinion, however, because like Defendant, Dr. Koenig's conclusion is premised upon the faulty conclusion that the function in question "requires coordination of the electromotive sources (motors)." (Dkt. #298, Exhibit B). As previously discussed, the claims at issue neither refer to nor require coordination between the electro-servo motors. While the patents' specifications refer to "additional code. . .to ensure proper coordination between the bat-swing and ball-delivery modules," such is not contained in the relevant claim language. As previously noted, it is the claim language that controls when identifying the claimed function.

2. Construct a Database

While phrased slightly differently, the function claimed in subsection (b) of all four claims is essentially the same, namely that the "programmed computer means" is to function to "construct a database of performance characteristics" based upon the information recorded or measured by the various sensors utilized by the sports-related testing system.

Defendant asserts that the patents in question fail to identify or describe the various "performance characteristics" referred to by this language. An examination of the patents as a whole reveals otherwise. The patents clearly state that the various sensors are designed to measure the following items, which are to be used to perform "a variety of analytical and/or statistical evaluations": (1) the swing speed of the implement (bat swing speed); (2) the delivery speed of the projectile (the pitch speed); and (3) the exit velocity of the projectile (the speed at which the ball leaves the bat after

being struck). ('861 Patent at col.1 lines 29-60, col. 1 line 66 - col. 2 line 4, col. 2 lines 43-60, col 5. line 6 - col. 6 line 23; '200 Patent at col. 1 lines 33-64, col. 2 lines, 2-7, 46-63, col. 5 line 9 - col. 6 line 26). In the Court's estimation, a common sense reading of the patents makes clear that the term "performance characteristics" as used in these claims refers to the items identified above and/or the results of the various analytical and statistical evaluations performed thereon.

Defendant further argues that the patent must also include computer code or other arcane instructions that detail precisely how the database will be constructed. The Court fails to discern the basis for such a requirement. Plaintiffs have not attempted to patent the manner in which the database is constructed, but have simply claimed that as part of the performance of the patented sports-related testing system, a programmed computer will "construct a database of performance characteristics" based upon the information recorded or measured by the various sensors. With respect to this function, the Court finds that the portions of the patents identified immediately above constitutes sufficient structure to satisfy the relevant standard.

3. Display Portions of the Database

The function claimed in subsection (c) of all four claims is identical. The "programmed computer means" is to function to "display selected portions of the database in accordance with the user input."

Again, in the Court's opinion, Plaintiffs have not attempted to patent a unique or novel method of displaying a database or any portion thereof. Instead, Plaintiffs have simply claimed that as part of the performance of the patented sports-related testing system, a programmed computer will "display selected portions of the database in accordance with the user input." With respect to this

function, the Court finds that the portions of the patents identified in the preceding section constitute sufficient structure to satisfy the relevant standard.

B. Remaining Construction Issues

Defendant asserts that the following italicized claim language requires further interpretation or construction by the Court:

1. a delivery speed sensor disposed along the delivery path outputting *a signal relating to the velocity* of the object upon delivery. ('861 Patent, Claim 1).

2. a delivery speed sensor disposed along the ball delivery path outputting *a signal relating to the velocity* of the ball upon delivery. ('861 Patent, Claim 6).

3. a ball-speed sensor disposed along the trajectory outputting *a signal relating to the exit velocity of the ball*. ('861 Patent, Claim 16).

4. an object speed sensor disposed along the flight path outputting *a signal relating to the exit velocity of the object*. ('200 Patent, Claim 1).

5. display *selected portions of the database* ('861 Patent, Claims 1, 6, 16; '200 Patent, Claim 1).

6. construct a database of *performance characteristics* ('861 Patent, Claims 1, 6, 16; '200 Patent, Claim 1).

7. *operative to* ('861 Patent, Claims 1, 5, 6, 9, 16, and 22; '200 Patent, Claim 1).

Aside from the phrase "operative to," which is addressed separately below, the Court finds that none of the italicized language above requires any further interpretation or construction by the Court. The Court finds that the ordinary and customary meaning of the claim language or claim

terms above is readily apparent to a reasonable lay person and, therefore, require no further interpretation by this Court.

II. Remaining Claims of the '861 and '200 Patents

The Court finds that very few of the remaining claim terms at issue require "construction" or "interpretation" by the Court. Aside from the two items discussed immediately below, the Court finds that the ordinary and customary meaning of the remaining claim terms at issue is readily apparent to a reasonable lay person and, therefore, require no further interpretation by this Court.[2]

A. "operative to"

The phrase "operative to" appears in nine locations in the various claims of the '861 Patent: twice each in claims 1, 6, and 16, and once each in claims 5, 9, and 22. This phrase also appears twice in claim 1 of the '200 patent. Both parties assert that this phrase should be construed in a manner more easily understood by a lay jury. The Court agrees.

With respect to this phrase, Plaintiffs offer the construction "able to" whereas Defendant offers the construction "programmed to." The Court adopts the construction, "able to," offered by Plaintiffs. The Court finds that the phrase "able to" is more consistent with the patents when considered in their totality. On the other hand, the Court finds the construction "programmed to" more restrictive and limiting than is warranted by the actual language of the patents as a whole and the specific claims at issue. Specifically, the phrase "programmed to" implies that the relevant action is to be accomplished

[2] The Court does not find it necessary to identify or list every disputed claim or claim term that the Court concludes does not require further interpretation or construction. *See United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction. . .is not an obligatory exercise in redundancy.").

by a computer or a computer program. Such a construction is simply not supported by the language of the claims or the patents as a whole.

B. "distal end"

The phrase "distal end" appears in claims 15 and 18 of the '861 patent. Plaintiffs assert that because this phrase would not be easily or properly understood by a lay jury, it requires construction by the Court. Plaintiffs offer the construction "one end." Defendant asserts that Plaintiffs' proposed construction is "just plain wrong" because the term distal "has an accepted meaning." While the Court agrees that the phrase "distal end" is unlikely to be properly understood by a lay jury, the Court declines to adopt Plaintiffs' proposed construction.

First, to simply replace the phrase "distal end" with "one end" in these two claims renders them, in the Court's estimation, even more difficult to understand. Under Plaintiff's proposed construction, the relevant language would read as follows:

> a ball-delivery module having a fork shaped *one end* with upper and lower members between which the ball is supported, enabling the bat to swing between the two members.
>
> ('861 Patent, Claim 15).

> The baseball bat test system of Claim 16, wherein the swing arm of the ball-delivery module includes a forked *one end* having upper and lower members between which the ball is supported and through which the bat swings to strike the ball.
>
> ('861 Patent, Claim 18).

Plaintiffs' proposed construction renders the claims difficult to read and understand. The Court's initial inclination was to simply omit the word "distal" from these two claims. While this would

render the claims easy to read and understand, as Defendant indicates it would do so by completely eliminating a word that has a precise meaning. The phrase "distal end" has been construed as "the end situated away from the point of origin or attachment," as contrasted with the phrase "proximal end" which has been construed as "the end situated toward the point of origin or attachment." *Arthrocare Corp. v. Smith & Nephew, Inc.*, 2003 WL 1856436 at *8 (D. Del., Apr. 9, 2003) (quoting *The Revised Random House College Dictionary*, 385 (revised ed. 1980)). In other words, an item or structure has (or can have) both a distal end and a proximal end. More importantly, the concepts "distal end" and "proximal end" each convey a separate and distinct meaning. The Court must presume, therefore, that Plaintiffs purposely included the phrase "distal end" in these claims and intended for these claims to include within their scope the limitation or meaning conveyed by the phrase "distal end" as opposed to "end" or "one end" and certainly contrary to the meaning conveyed by the phrase "proximal end." Accordingly, the Court construes the two claims at issue as follows:

> Claim 15 of the '861 Patent
>
> a ball-delivery module having a swing arm in which the end furthest from the vertical shaft to which it is connected is fork shaped with upper and lower members between which the ball is supported, enabling the bat to swing between the two members.
>
> Claim 18 of the '861 Patent
>
> The baseball bat test system of Claim 16, wherein the end of the swing arm furthest from the vertical shaft connecting it to the ball-delivery module is fork shaped with upper and lower members between which the ball is supported and through which the bat swings to strike the ball.

CONCLUSION

Having considered the parties' submissions and arguments, the Court construes the claims of the '861 Patent and the '200 Patent as detailed herein.

Date: November 3, 2008

/s/ Ellen S. Carmody
ELLEN S. CARMODY
United States Magistrate Judge